

M/001/039

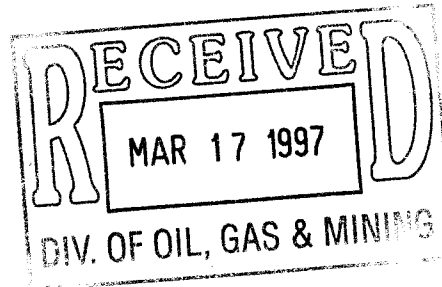


CENTURION MINES CORPORATION

331 SOUTH RIO GRANDE STREET, SUITE 201 P.O. BOX 2365 SALT LAKE CITY, UTAH 84110 801-534-1120
FAX: 801-534-1129

March 17, 1997

Utah Department of Natural Resources
Division of Oil, Gas, and Mining
Mr. Tom Munson
1594 West North Temple, Ste. 1210
Box 145801
Salt Lake City, Utah 84114-5801



Dear Tom:

Dotson Exploration, a wholly owned subsidiary of Centurion Mines Corporation, hereby presents the following arguments with respect to the heap leach rinsing and capping currently under consideration by the State of Utah.

Dotson has been working on the permitting of the OK Mine facility for approximately one year. During this time, both the Department of Health and the Division of Oil, Gas, and Mining conducted site visits.

During the initial stages of permitting, Dotson thoroughly reviewed all pertinent available documents available from all State agencies. Draft permits were submitted to each agency which complied with all applicable standards.

Subsequently, reviews were received from each State agency. No mention was made of either capping or rinsing in either review. Dotson personnel worked through the Christmas and New Years holidays to answer all pertinent questions contained in the DOGM Initial Plan Review. The plan was resubmitted in early January.

We were informed on March 13, 1997 that the Division of Health has been planning to implement a "cap all heaps" policy and Summo has been one of the first to be affected and therefore, so that we may be treated fairly, Dotson should also be included.

Dotson strongly feels that enough scientific evidence is available to show conclusively that capping is not warranted at the OK site. There is no potential to degrade the waters of the State and no advantages will be gained in re-vegetation and in fact the rinsing and capping may prove a disadvantage to re-vegetation.

Based on the preceding logic, Dotson hereby requests that we be allowed a period of 18 months to precisely define these issues. The following is offered as technical back-up to support the arguments on not rinsing or capping.

0004

<http://www.xmission.com/~centurio/centurion.html>
email: centurio@xmission.com

1) As shown in the geology section of the reclamation plan, the entire ore body and surrounding area, is comprised of an alkaline intrusive rock called granodiorite. The ore, waste, and topsoil are all chemically similar. Each is comprised of orthoclase and plagioclase feldspar, ferro-magnesium components biotite and hornblende, and extremely minor amounts of copper, iron, and other minerals. The pH of the rocks and soils are very high and all are aggressive acid consumers. Only plants with very high alkaline resistance grow at the site. Underlying and surrounding the pad are miles of similar alkaline intrusive rocks. Their capacity to consume acid is the subject contained within the groundwater report and copied for this document.

During leaching, the sulfuric acid solubilizes oxide copper, iron, calcium, aluminum, potassium, and minor amounts of other soluble metals. All of the above form sulfates (of sulfates of salts) when reacting with the acid. The analysis of this solution was submitted with the initial plan. The copper ion is selectively removed from the solution and the remainder of the solution is returned to the pad. Due to the extremely active acid consuming capacity of the ore, large quantities of acid need to be added to the system to keep it acidic. Without the addition of acid, the pad would rapidly return to a basic condition.

2) None of the "bad actor" metals exist in this particular geologic environment. Analysis contained in the original report and copied for this document show only trace amounts on lead, zinc, arsenic, antimony, mercury, etc. No bad chemicals exist in the system, none are added, and none are created.

3) A previous operator vat leached approximately 220,000 tons of the OK ore. A section documenting this is attached. The OK ore consumed approximately 70 pounds of acid per ton after crushing. After leaching, the ore was drained and off-loaded. According to operators, the ore was not rinsed. These tails have a pH of 8.20 as measured and included in the original submission. The tails retain an extremely high ability to consume acid as evidenced by sample 23568 from Chemex Labs. This showed a +38.4 Acid Consumption (38.4 tons of lime per 1000 tons of material).

4) The region is very arid having a total rainfall of 8.5 inches as shown in the plan. Most of the precipitation occurs as summer rainstorms. The regraded heap will shed most of this precipitation. We expect little or no percolation through the pad even without a "cap". Permeability of the heap will drastically decrease with age as compaction in lower lifts combine with products of clay alternating to form a fairly low permeability environment.

5) There are no known radio-active elements in the district.

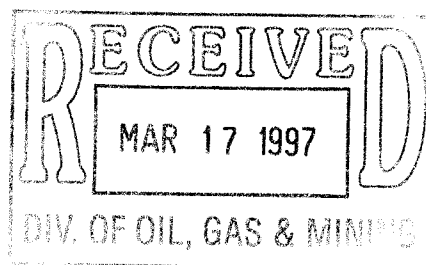
6) In this alkaline environment, it is extremely common to add sulfuric acid as a soil modifier to improve the pH of soils. We believe that an unrinsed heap, may actually benefit growing plants and remaining iron and other trace minerals may act as nutrients. It has been proven and can be re-proven that the heap will quickly return to basic pH's without rinsing.

Best Regards,

CENTURION MINES CORPORATION



Rick Havenstrite
Vice President of Operations



CHEMICAL
CHARACTERISTICS
OF
ORE/WASTE/OVERLINER
AND
PROCESS SOLUTIONS

6.0

Chemical Analysis Ore/Waste/Process Solutions

Material Type	Analytical Procedure	Sample I.D. #
Low Grade Ore/Waste	Acid/Base Potential Characteristics	Chemax 23567A Chemax 23567A-1
Typical Waste-	Acid/Base Potential Characteristics	Chemax 23567B Chemax 23567B-1
Pad Overliner -	Acid/Base Potential Characteristics	Chemax 23568 Chemax 23568-1
Low Grade Ore/Waste-	Total Analysis	Col-Tech 23567A
Overliner-	Total Analysis	Col-Tech 23568
Leach Solution-	Total Analysis	Chemex 23835C
Topsoil	Characteristics	Utah State University

CHEMAX Laboratories, Inc.

Analytical and Environmental Chemists
EPA Lab ID #NV004

(702) 355-0202
Fax (702) 355-0817

LABORATORY REPORT

Report To: Kappes, Cassiday & Associates
7950 Security Circle
Reno, NV 89506

Lab Report No.: 15183
Account No.: KPCAS

Telephone: 972-7575

Fax: 972-4567

Work Authorized By: Jim Defilipi
Date Sampled: Unknown
Number of Samples: 3
Source: See Below
Chemax Control No. 96-2779 thru 2781
Notes:

Date Submitted: 05/10/96
Sampled By: Client
Your Reference:

Parameter	Result		
	23567 A	23567 B	23568
<u>ACID GENERATING POTENTIAL*</u>			
pH (saturated paste)	8.33	8.36	8.22
Neutralization Potential**	20	20	39
Acidification Potential**	0.3	5.3	0.6
Acid Generating Potential**	+19.7	+14.9	+38.4
Total Sulfur, %	0.03	0.03	0.01
Sulfate Sulfur, %	0.01	0.01	<0.01
Sulfide Sulfur, %	0.01	0.17	0.02
	ORE	WASTE	OVERLINER

Remarks: * Per EPA 600/2-78-054, "Field and Laboratory Methods Applicable to Overburdens and Mine Soils".

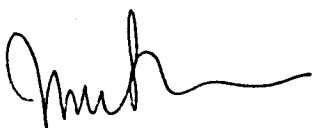
** In tons CaCO₃ equivalent/1,000 tons material.

Acid Generating Potential = (Neutralization Potential) - (Acidification Potential)

Analysis By: Hulett/Joyce/AAL

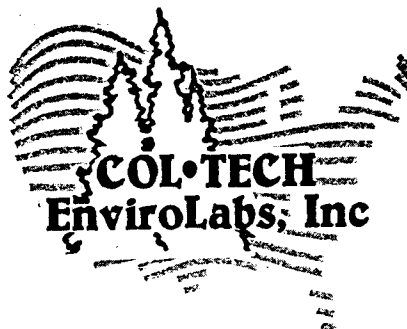
Date: 05/30/96

Approved By:



Date: 05/30/96

Page 1 of 1



CLIENT: Mr. Jim Defilippi
KAP001 Kappes Cassiday & Assoc
7950 Security Circle
Reno NV 89506

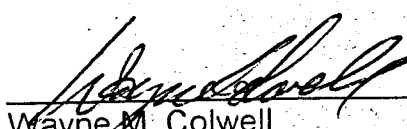
DATE: June 5, 1996
ORDER NUMBER:
INVOICE NUMBER: K0347B
LABORATORY NUMBER: K131-03B

REPORT OF ANALYSIS

REPORT ON: 32 element analysis
ANALYTICAL METHOD: ICP - *LOW GRADE ORE/WASTE* PAGE: 1 OF 2

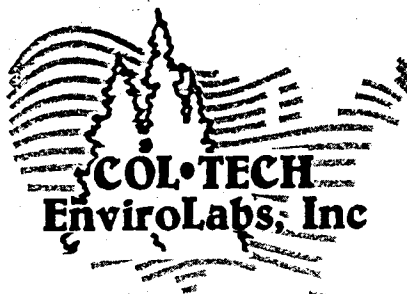
SAMPLE ID: 23567A

ELEMENT:	(ppm)	ELEMENT:	(ppm)
Aluminum	9482	Manganese	265
Antimony	1.27	Mercury	<2.00
Arsenic	<4.00	Molybdenum	63.7
Barium	52.2	Nickel	9.14
Beryllium	<0.05	Phosphorous	771
Bismuth	<0.05	Potassium	1458
Cadmium	12.5	Scandium	3.24
Calcium	7235	Selenium	<2.00
Chromium	38.5	Silver	0.67
Cobalt	11.1	Sodium	232
Copper	1795	Strontium	23.9
Gallium	<0.50	Thallium	<2.00
Iron	30,007	Tin	<2.00
Lead	10.3	Titanium	539
Lithium	11.2	Vanadium	65.7
Magnesium	7592	Zinc	48.1


Wayne M. Colwell
General Manager

COL•TECH EnviroLabs, Inc.

1855 Deming Way, Sparks, Nevada 89431 PH 800 774 3636, 702 331 3600, FAX 702 331 7264



CLIENT: Mr. Jim Defilippi
KAP001 Kappes Cassiday & Assoc
7950 Security Circle
Reno NV 89506

DATE: June 5, 1996
ORDER NUMBER:
INVOICE NUMBER: K0347B
LABORATORY NUMBER: K131-03B

REPORT OF ANALYSIS

REPORT ON: 32 element analysis
ANALYTICAL METHOD: ICP - OVERLINER

PAGE: 2 OF 2

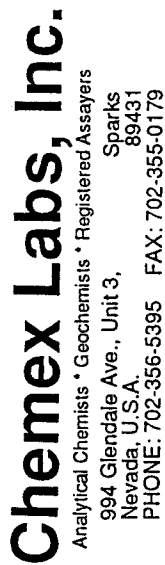
SAMPLE ID: 23568

ELEMENT:	(ppm)	ELEMENT:	(ppm)
Aluminum	6965	Manganese	3447
Antimony	10.2	Mercury	<2.00
Arsenic	18.4	Molybdenum	98.1
Barium	83.1	Nickel	6.30
Beryllium	<0.05	Phosphorous	329
Bismuth	36.6	Potassium	2005
Cadmium	81.8	Scandium	<2.00
Calcium	25,798	Selenium	<2.00
Chromium	21.7	Silver	16.6
Cobalt	49.8	Sodium	<2.00
Copper	6649	Strontium	23.23
Gallium	<0.50	Thallium	<2.00
Iron	200,270	Tin	<2.00
Lead	22.6	Titanium	302
Lithium	7.94	Vanadium	29.6
Magnesium	27058	Zinc	371


Wayne M. Colwell
General Manager

COL-TECH EnviroLabs, Inc.

1855 Deming Way, Sparks, Nevada 89431 PH 800 774 3636, 702 331 3600, FAX 702 331 7264



To: KAPPE, CASSIDAY & ASSOCIATES

7950 SECURITY CIRCLE
RENO, NEVADA
89506

Project : W.O. #3923
Comments:

Page Number : 1
Total Pages : 1
Certificate Date: 05-JUN-96
Invoice No. : 19619651
P.O. Number :
Account : BDQ

SOLUTION FROM ORE

CERTIFICATE OF ANALYSIS

A9619651

PARAMETER DESCRIPTIONS	SAMPLE 23835 c
Sample preparation code	221
Sample preparation code	--
Ag mg/L	< 0.01
Al mg/L	840
As mg/L	1.95
Ba mg/L	< 0.1
Be mg/L	0.205
Cd mg/L	480
Co mg/L	0.310
Cr mg/L	2.8
Cu mg/L	0.64
	>1000
Fe mg/L	1730
K mg/L	65
Mg mg/L	690
Mn mg/L	145
Mo mg/L	0.25
Na mg/L	22
Ni mg/L	1.50
P mg/L	200
Pb mg/L	0.65
Sb mg/L	< 0.05
Sr mg/L	2.2
Ti mg/L	1
V mg/L	3.4
Zn mg/L	15.0
Chloride (mg/L)	8.0

CERTIFICATION: Stanley Zucker

CHEMAX Laboratories, Inc.

Analytical and Environmental Chemists
EPA Lab ID #NV004

(702) 355-0202
Fax (702) 355-0817

LABORATORY REPORT

Report To: Kappes, Cassiday & Associates
7950 Security Circle
Reno, NV 89506

Lab Report No.: 15373
Account No.: KPCAS

Telephone: 972-7575

Fax: 972-4567

Work Authorized By: Terence E. Albert
Date Sampled: Unknown
Number of Samples: 3
Source: Sec Below
Chemax Control No. 96-3240 thru 3242

Date Submitted: 05/29/96
Sampled By: Client
Your Reference:

LOW GRADE WASTE OVERLINER

Parameter	Results		
	23567A-1	23567B-1	23568-1
pH _{SE}	8.40	8.43	8.74
EC _{SE} mΩ/cm	0.30	0.30	1.6
Cation Exchange Capacity, mcq/100g	8.1	7.5	7.1
Nitrate Nitrogen, mg/kg	<4	<4	<4
TKN, mg/kg	66	63	66
Phosphorus, mg/kg as P ₂ O ₅	12	15	29
Potassium, mg/kg as K ₂ O	690	640	410
Organic Matter, %	2.0	2.0	2.0
Saturation, %	28	29	27
Texture*	Fine	Fine	Fine
Alkalinity, mg/kg as CaCO ₃	92	248	157
Sodium Adsorption Ratio	2.5	2.4	0.5
Selenium, mg/kg	<10	<10	<10

Remarks: SE = Saturated Extract
* Samples submitted in pulp form

Analysis By: Barton/Faulstich/Joyce/Lortice/Shen, B./Shen, M.

Date: 07/02/96

Approved By: 

Date: 07/02/96

Page 1 of 1

Utah State UNIVERSITY

USU ANALYTICAL LABORATORIES

Utah State University

Logan, UT 84322-4830

Telephone (801) 797-2217

Fax (801) 797-2117

5 July 1996

Post-it® Fax Note		7671	Date	7-29	# of pages	1
To	Barry Katona		From	Amy		
Co/Dept.	Centurion Mines		Co.	USU		
Phone #	Mines		Phone #	797-2217		
Fax #			Fax #			

Notes for:

Barry Katona

Centurion Mines Corporation

331 South Rio Grande Street

Suite 201

PO Box 2365

Salt Lake City, UT 84110

Soil sample received 6/5/96.

USU#	ID	*SP	pH	EC mmbos/cm	SAR	--H2O Soluble-- CO3 HCO3 ---- meq/L ----	-- NaHCO3 -- P K -- mg/kg --	NO3-N mg/kg	Ash %OM	%TN	CEC meq/100g	Sand	% Hydrometer Silt Clay	Texture			
1510	1	20.3	8.0	0.4	0.5	0	1.78	7.6	166	3.5	2.89	0.05	7.8	71	20	9	SL
USU#	%CaCO3		Hydride Se		Alkalinity mg/kg		mgCaCO3/L										
1510	5.4		< 0.25		89												

*SP = Saturation Percentage
Numbers to follow upon completion.

If you have any questions, please contact the lab.



Pad Design

The proposed pad covers an area that is 1250 feet wide and 1900 feet long for a total area of 2,375,000 square feet. The pad will be built on private property approximately 3000 feet south of the pit. The slope of the pad is 4.7% down gradient (north to south) and will drain at about 1% west to east.

The pad liner system will consist of, a 60-mil HDPE primary liner, 12 inches of compacted soil with the maximum hydraulic conductivity of 1×10^{-7} cm/sec., filter fabric (geotextile), six inches of drainage layer having the minimum hydraulic conductivity of 1×10^{-2} cm/sec., leakage collection piping placed at 200 feet on center, and 12 inches of compacted sub-base having the maximum hydraulic conductivity of 1×10^{-6} cm/sec.

The rocks and soils underlying the pad have a pH of 8.2-8.3 based on numerous samples. These soils will attenuate considerable amounts of acid in the event minor pad leakage occurs. To demonstrate this, a test column was run. 46 pounds of typical material was loaded in to a 4 inch diameter column. The column height was exactly six feet. A sulfuric acid solution was mixed to simulate the approximate composition of return solution from the pad. This solution had a measured pH of 2. The solution was then dripped in to the column at the approximate expected application rate. To date, 4000 ml of solution has returned and the pH is still 7. Based only on the results to date, the underlying soils have consumed the acid in solution at the rate of .0229 gallons of solution per pound of soil (converted the solution from a 2 pH to a 7 pH). At this rate, every vertical foot of underlying soil will attenuate over 8.42 million gallons of solution or a continuous leakage rate of 1.6 gpm for 10 years. The 100 vertical feet of soil under the pad will attenuate 842 million gallons of solution or 160 gpm for 10 years. Centurion acknowledges that leaked solution would not evenly distribute immediately under the pad, however, the same acid consuming rocks surround the property for several miles in each direction and also exist for miles below the pad.

The calculations for this are as follows:

$4000 \text{ ml} \times 1 \text{ gallon}/3.755 \text{ liters} = 1.057 \text{ gallons applied to 46 pounds of soil}$

$1.057 \text{ gallons}/46 \text{ pounds} = .0229 \text{ gallons/pound soil}$

THE SHIELD DEVELOPMENT COMPANY LTD.

UTAH MINES DIVISION

BOX 338 MILFORD, UTAH 84751

TEL. 801-387-2278

April 15, 1971

5

Mr. J. P. Sheridan
The Shield Development Co., Ltd.
4 King St. West - Suite 1500
Toronto / Ontario / Canada

Dear Mr. Sheridan:

The report of operations for the month of March, 1971 at the Utah Mines Division is herewith presented for your consideration:

1) MINE

Mining continued at elevation 5,975'. The ore grade of 1.17% Cu. was mostly oxide in form of malachite.

Production	This Month		Year To Date	
	Ore	Waste	Ore	Waste
Broken	23,000		74,000	2,800
Trucked to Stockpile		1,060		11,925
Trucked to Mill	31,680		78,210	

2) MILL

Vat leaching accounted for approximately 30% of total production this month. The vat leach and the low chrysocolla content of the ore helped to keep acid consumption to an all time low of 3.56 lb. acid per pound of copper produced.

Production	This Month	To Date
Dry tons milled	20,510	55,511
Dry tons per day	662	617
Head Grade % Cu.	1.31	1.20
Dry tons vat leached	8,350	14,150
Dry tons vat leached per day	269.35	141.59
Head Grade % Cu.	0.84	0.85
Total Tons treated	28,860	69,661
Head Grade all ore treated % Cu.	1.17	1.13
Lbs. Cu. precip. shipped	507,262	1,122,518
Grade % Cu. precip. shipped	83.21	82.70
Operating Time - Ball Mill	93.2	89.8

MILL (Continued)

	<u>This Month</u>	<u>Year To Date</u>
Production	1,808,000	4,860,500
Lbs. acid used	3.56	4.33
Lbs. acid used per lb. Cu.	700,000	1,498,000
Lbs. scrap used	1.38	1.33
Lbs. scrap used per lb. Cu.	1,450	6,390
Lbs. flocculent used	.07	.12
Lbs. flocculent used per ton-ore		

COST

Total expenditures plus accruals:

	<u>This Month</u>	<u>Year To Date</u>
Construction	\$ 41,470.50	\$ 76,576.56
Lease Payments	1,639.00	4,317.00
Mining	30,099.55	54,167.31
Milling & Administration	182,849.42	435,428.13
Actual Production Cost - Mar.	\$ 140,725.13	
Cost per ton of ore milled	\$ 4.88	
Cost per lb. of Cu. shipped	\$.28	

GENERAL

The precipitation tower was completed and two decant ponds were enlarged to hold additional solutions. Number two well pump burned out and had to be sent out for repairs.

Exploration work on the Intermountain ground showed some copper stains. This area will be tested further in April.

Respectfully,

THE SHIELD DEVELOPMENT CO., LTD.

Ralph N. Kleine
RALF N. KLEINE, P. ENG.
General Manager

3/11

END.